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WE have received the printed report of the supervising architect of the Treasury Department, to which we alluded in our number of Jan. 6. We noticed at that time some of Mr. Hill's general recommendations. The report is a concise document, telling as usual the condition and progress of the work which has been going on under the supervising architect during the year, and giving the standard tabular statement of the cost and history of all the buildings, old and new, which come under charge of his office, including custom-houses, court-houses, post-offices, marine hospitals, appraisers' stores, mints, and assay offices, to the number of one hundred and fifty-seven. To this are added two lists such as we do not remember to have seen before, — one of all the appropriations made thus far for buildings which are now under construction, and another of contracts pending in the office at the date (September, 1876) to which the report is made up. The number of buildings given as in construction is twenty-nine, including post-offices at Atlanta, Ga.; Albany, N.Y.; Boston, Mass. (extension); Chicago, Ill.; Cincinnati, O.; Covington, Ky.; Dover, Del.; Evansville, Ind.; Fall River, Mass.; Grand Rapids, Mich.; Hartford, Conn.; Lincoln, Neb.; Memphis, Tenn.; Nashville, Tenn.; New York City (stairs and elevators); Parkersburg, W.Va.; Port Huron, Mich.; Raleigh, N.C.; Rockland, Me.; St. Louis, Mo.; Trenton, N.J.; Jersey City, N.J.; Little Rock, Ark.; and Philadelphia. Almost all these buildings are to serve also as custom-houses or United States court-houses. There are besides the custom-houses at Charleston, S.C., and New Orleans, which are undergoing alteration; the new assay office at Helena, Mont., and appraisers' stores at San Francisco, and the old mint in the same city, which is to be changed into a sub-treasury. Of the buildings (except the New York Post-Office, which is practically finished), the most important are the Philadelphia Post-Office, the Boston Post-Office extension, and the combined custom-houses and post-offices at Chicago, Cincinnati, and St. Louis, none of which are very far advanced in construction, and each of which, before it is finished, will cost some millions of dollars.

A COMPARISON of the table of appropriations with the account of expenditures gives some curious results. Some five or six years ago Congress, finding that the cost of buildings always amounted to more than was at first proposed, and generally very much more, adopted the policy of attaching to each appropriation the condition that the whole cost of the building for which it was given should not exceed a fixed sum. The old method of building by the day and with successive appropriations was continued, however, and its uncertainty was continued with it. Moreover the ideas of Congress as to the needs of the buildings, and the cost of supplying them, were on a very economical scale. A look at the tables in the report shows that of the buildings in hand, at least such as have been carried at all far, there are very few which have not outrun their appointed limit, except when that limit has been raised with successive appropriations. Thus the limit of the cost of the Chicago building was fixed in 1871 at four millions of dollars. Up to the date of the report, very nearly four millions had been expended on it, from which is to be deducted a million and a quarter for the cost of the site; and the stone walls had not been carried up to the main cornice. The first limit fixed for the cost of the post-office at Cincinnati was a million and three-quarters. It was afterwards increased to three and a half millions. More than two millions have been expended, and the basement walls are not up, though the stone is mostly cut for the first and second stories. The limit for the Hartford Post-Office was four hundred thousand dollars; three hundred and seventy-five thousand have been expended, and the stonework is set to half way up the second story. These are extreme cases, but there are many more or less like them. The work on most of the buildings has been in hand for three or four years; and the result shows that Congress has not known at all what it was undertaking, and that under the system in use it could not know. It offers the strongest argument for the adoption of the contract system, which the present supervising architect and his immediate predecessor have been earnestly advocating. It shows too the unwisdom of Congress in attempting, of its own judgment, to fix the limit of an expenditure of which it or any inexpert body could not possibly know the needs, nor could the strongest expert without the aid of elaborate plans and estimates. To set the limit of cost of the Philadelphia Post-Office, for instance, at a million and a half of dollars, with the experience of the New York and Boston buildings already well under way, as was done at first by Congress, was preposterous. A further difficulty is in the habit of making slow and inadequate appropriations. We notice that of the buildings now in hand, seven are either stopped, or likely to be very soon stopped, for want of the necessary funds. These stoppages waste not only time, but money; and this both by the inevitable increase of cost from checking work and beginning it again, and because an unfinished building deteriorates very fast, and if it waits long is sure when it is resumed to need considerable rebuilding before it can be carried forward.

THE last testimony reported, as we write, from the coroner's jury on the Ashtabula disaster, is somewhat significant. The master-machinist who had charge of the construction of the bridge testified that in building it, he found the material provided inadequate to the design. He told Mr. Tomlinson, and advised him to speak to the president, Mr. Stone, and soon after received orders to finish the bridge himself according to his own judgment. (It will be remembered in this connection that Mr. Tomlinson, according to his own testimony, after protesting against the use of insufficient material in the braces of the bridge, resigned his position on account of a disagreement with Mr. Stone about it.) The machinist further testified that he had not computed the strength of the bridge, or discussed its design, not considering himself competent. After Mr. Tomlinson's leaving he finished the construction, and the bridge was shipped to be put up. The mechanic who put it up by order of the president did not know how to do it, and confessed his dislike to ask directions from Mr. Stone, — whether from dread of that gentleman, or from fear of confession of incapacity, does not appear, — and the machinist "told him as much as he knew." The chief engineer of the road has committed suicide since his examination before the legislature. He had not, so far as we know, been charged with special responsibility for the accident; but the feeling that it occurred in consequence of the failure of work which was under his charge might well have seemed an intolerable burden. It is not desirable to express or to form a decided opinion while the investigation is pending; but the reflection suggests itself that a much less degree of sensitiveness than the unfortunate engineer has shown, on the part of the person who controlled the construction of the bridge, coupled with a little of the modesty of the machinist, might have saved a hundred or so of lives.

ENGLISH papers mention a building accident which deserves some attention. One Mr. Barnes had engaged a builder to build him a house by contract, accepting the plans and specifications furnished him, and leaving the whole matter to the builder, since he himself knew nothing about building. He had been in the house but a week or two when a part of it fell down and killed his child. The coroner's jury rendered a verdict "that the death of the child was caused through neglect and the improper way in which the house had been built." The house was built of brick, with hollow walls; and the part that fell was on a cellar wall of lime concrete. The architect who was called to examine the house testified that the mortar in which the brick was laid was poor, and the concrete foundations were of improper quality. He attributed the fall of the house to the yielding of the concrete under unequal pressure from the brickwork. This and many other accidents which have lately happened from the giving way of concrete buildings show that, whatever be the merits of concrete as a material, it is the last in which shirking builders should be allowed to take refuge, as it is one whose behavior in adversity is least to be counted on. The cleverness with which a class of bad builders are learning to adjust the strength of their buildings, so that they shall be just able to bear up under their own weight and no more, begins to be appalling. But the significant fact in the case we mention is that the coroner's verdict was held by court to be equivalent to an accusation of manslaughter, and the builder was committed to be tried for that offence. If the laws in this country for the security of theatres, halls, and buildings generally in fact, could be clinched by the enforcement of such responsibility as is here maintained, the lives of the public would be safer.

AN effort is making in Boston to build a monument in commemoration of the Norsemen, who are believed to have been the first European discoverers of North America in the eleventh century. A rock lying in the Taunton River, in the town of Dighton, and known as the Dighton Rock, has long been a puzzle to local archæologists, because of certain inscriptions upon it which they have been unable to read, and which they have been inclined to ascribe to the Norse discoverers. On the other hand persons are not wanting who argue that the inscriptions on the rock are not different in character from many others found in the country, and which are ascribed to the Indians. The Danish society of antiquaries at Copenhagen was at one time induced to purchase the rock, but it was redeemed by the efforts of some gentlemen of Boston. The testimony of the Danish archæologists is not decisive. They have found, we are told, a conjectural interpretation for a small portion of the inscription; but it still remains doubtful whether it is or is not Runic. It has been proposed that the rock should be removed to Boston, — since the inscription is in danger of destruction where it now is, — and made to form part of the new monument.

WE believe that the theory of the Norse discovery is now pretty generally accepted; and the idea of the commemorative monument is a pleasant one. Monuments are good things to have, if only they are good monuments; and the more we build, the better we shall be likely to build them. There is an advantage to a country in having its early history visibly commemorated even when it runs back into dim legends; and it may not be amiss to New Englanders to be reminded that at least the rocks and the rivers existed before the landing of the Pilgrims. But with regard to the removal of the rock we would suggest that a vernacular rock is likely to be an ugly thing in a monument, as unmanageable as the Vicar of Wakefield's picture, and that the monument would probably be spoiled by having to be built to include it. Besides which, the interest of such a memorial is far greatest when it is in the place to which its memories belong. It loses half its charm when it is carried off and set down away from its natural associations. Let us fancy the rock at Tell's Platte hewn out and set down in Lucerne, or the Pilgrim Rock on view at the Boston State House. It must be nearly as easy to protect the rock from decay in its original surroundings as in Boston. This for those who believe that its inscription was the writing of the Norsemen. There remains the danger of incongruity that would result if the rock were really built into a monument to the Northmen, and it were afterwards found that the Vikings had been invoked to preside over a red man's diary.

MR. WOOD'S EXPLORATIONS AT EPHESUS.[1]

IT is now nearly fourteen years since Mr. Wood began his excavations at Ephesus, in the hope of fixing the site and finding the remains of the famous Temple of Diana, thrice built and thrice destroyed. It was the last of the three structures, raised by the common efforts of all the Ionian States after Herostratus had won his baleful immortality by burning its famous predecessor on the night of the birth of Alexander the Great, that was celebrated as one of the wonders of the world. Fired by the Goths in the second half of the third century, and soon after razed by the zealous Christians, it is said to have furnished Justinian with material for the building of St. Sophia. The description given by Pliny of this, the largest of all the Greek temples, with its hundred columns, some twoscore of which were sculptured, and mostly the gifts of kings, its splendor of marble and gold, and the allusions to it in other classical writers, inspired Mr. Wood with the hope of finding material for its restoration. Seconded by the influence of the authorities of the British Museum, he in 1863 secured from the Sultan a firman authorizing him to make excavations wherever he could get the consent of the land-owners, and set to work at his own expense upon his first researches; it was not till he had carried them as far as his own means would allow, that funds were put at his disposal by the trustees of the Museum, and afterwards by the British Government, which enabled him to carry through his undertaking. The field of exploration was very wide, and indications to the explorer very vague; but he persisted, in defiance of disappointments and difficulties, in spite of slenderness of means and rather distrustful support, through several years of ineffectual effort, at least so far as his main purpose was concerned, with an obstinacy of purpose that, as it is revealed in the record of his work, wins the reader's astonishment and admiration.

Mr. Wood's book, a thick and handsome quarto liberally illustrated with woodcuts and lithographs, is not an archæological essay, nor a systematic discussion of the ruins that he examined and the relics he discovered, but rather an illustrated diary of the progress of his work and his personal adventures in the prosecution of it. The method, or lack of method, with which the main subject is treated, may please the general reader by relieving his attention from the study of architectural problems, but is likely to be a stumbling-block to the professional reader, who may think that there is a great deal more told of the process of discovery than of the things discovered. It is by no means always clear how Mr. Wood arrives at the deductions he makes or at the restorations he contrives: in fact, of his processes of reasoning comparatively little is given; and while no great amount of the data are shown on which his conclusions rest, such as are given are not arranged so as to support them, but are thrown in as they come up in the course of his narrative, no effort being made to digest and order them. The reader, therefore, if he would test Mr. Wood's opinions and judge of his restorations, must go through the same processes that the author has, of gleaning the significant facts, weighing and combining them for himself, but with only a small portion of the author's data at hand. It may be hoped that at some time Mr. Wood will publish such a carefully arranged and illustrated account of his conclusions and their evidences, as will show just how much is knowledge, and how much is inference or assumption, with the facts on which all are based.

In his search for the temple Mr. Wood had for his guidance only certain references to it in the classics. The authors concurred in saying that the temple stood on low ground. Pliny says "on marshy soil, that it might not suffer from earthquakes." Vitruvius says that the shafts could not be transported on wagons because the roads lay low and soft. It was a furlong or two outside the city. A road led to it from the Magnesian gate in the city wall; and

[1] Discoveries at Ephesus, including the Site and Remains of the Great Temple of Diana. By J. T. Wood, F. S. A., Fellow of the Royal Institute of British Architects. With numerous illustrations from original drawings and photographs. Boston: James R. Osgood and Co.

beside the road was the tomb of Androclus. Moreover a certain Damianus had built a *stoa* or portico of stone a furlong in length along the road, and leading to the temple, so that in rainy weather the priests could go to it from the city under cover. Hard by the temple ran a river, the Selinus. But around the hills on which the city was built lay on three sides broad and bare alluvial lands intersected by several streams. The gates and even the walls were fallen and buried. The old roads had disappeared, and there were no temple ruins to be seen. Some slight indications which he noted led Mr. Wood to search first on the west side of the city. The season of 1863 was wasted, so far as his main purpose was concerned, in fruitless excavations which consumed all the private means which he could spare for the search. At this point he obtained from the British Museum an allowance of one hundred pounds for the continuance of his excavations; but the trustees, preferring the bird in the hand, and apparently having no great faith in that in the bush, coupled the grant with the condition that his explorations should be confined to the Odeon or music-theatre, whose site was known. After a year's work and nearly a year's delay, a second allowance was appropriated to the great theatre; and it was not till 1867 that he obtained permission to use a small sum in continuing his search for the temple. This time he was fortunate enough to discover the eastern wall, and in it a gate which he identified, he does not say how, as the Magnesian gate. This was his first clear indication of the right direction in which to search. Uncovering two buried roads which led from this gate, he found that the pavement of that which led to Magnesia showed but little wear, while the opposite one, leading to the modern village of Ayasalouk, was worn into four deep ruts by the passage of chariot-wheels. He at once decided that this must be the road to the temple; and exploring it for some distance lighted at length on the remains of what he decided to be the portico of Damianus. At that point the funds allowed him gave out; and this and a visit to England interrupted the excavations for another year. The next year, returning to his work, he discovered farther down the road a massive foundation which he felt convinced was that of the tomb of Androclus. Finally when he had received a last grant of two hundred pounds with the assurance that unless he succeeded by its help in finding the temple he must not expect further assistance, and when any real indication of the exact site was as little to be seen as ever, by a lucky excavation he hit upon a heavy wall, at an angle of which were duplicate inscriptions in Latin and Greek telling him that this wall had been built by Augustus, and that it was to be maintained out of the revenues of the temples of Diana and Augustus. This then was undoubtedly the wall which Tacitus says that Augustus built about the temple, to mark the limits of the right of asylum which it afforded to criminals. This *peribolus* wall itself, by the way, Mr. Wood stigmatizes as disgracefully poor work, "probably contract work." Thus after six years of persistent work in the face of opposition from the inhabitants, impediments from the authorities, mistakes and disappointments, slender resources, distrust, fatigues, illness, and even personal violence, he at last found assurance of success.

After another visit to England he returned with a new allowance from the trustees of the Museum. He continued his excavations, and on the last day of 1869 discovered a part of the pavement of the temple itself, twenty feet below the surface of the ground. Further examination discovered a number of interesting fragments, — a drum of one of the sculptured columns, a capital or two, fragments of frieze-sculptures, a base with its plinth, in position, a mosaic pavement representing a Triton, and others. These fragments, sent home in government ships whose assistance was procured by the authorities of the Museum, gained him an appropriation of six thousand pounds from the British Government, after which the excavations were carried on rapidly till the whole immense area of the temple itself was uncovered and examined, a process which lasted till March, 1874, when the work was abandoned, and by which time sixteen thousand pounds in all had been expended during eleven years of work.

Examination showed that the temple had been three times built on the same foundation, and that after the burning by Herostratus it had been rebuilt not only on the old foundation, but on the old plan. The pavement first discovered proved to be that of the first of the three temples, or, as Mr. Wood more cautiously calls it, the last temple but two. Subsequently portions of the pavements of the later temples were uncovered, the last some ten feet above the level of the first, showing that each time the temple was rebuilt the floor was raised four or five feet. A curious confirmation of the old accounts of the temple was found on digging below the pavement. Pliny and other writers say that to prevent the dampness rising in the temple, a bed of charcoal was laid under the floor, and upon this fleeces of wool were placed. Accordingly Mr. Wood found, five feet or more below the lowest floor, a layer of charcoal three inches thick, between two layers of a putty-like substance which proved to be a mortar containing traces of organic matter. Portions of the wall of the *cella* and of the outer line of steps and the bases of some columns, found undisturbed, gave an opportunity of measuring the size of the temple. The platform at the lowest step measured four hundred and eighteen feet by two hundred and forty (nearly), showing that the measurements of the *universum templum* given by Pliny — four hundred and twenty-five Roman feet by two hundred and twenty — included the whole platform. The temple was found to be octostyle and dipteral, as described by Vitruvius; the number of columns in the peristyle, as laid down by Mr. Wood, including those between the *antæ* of the *cella*, agrees with the number, one hundred, given by Pliny. The finding of sculptured drums opposite each end of the building whose long axis was east and west, indicated that the porticos on both fronts were of sculptured columns; and since the normal arrangement of an octostyle temple gives eighteen columns in front of each end of the *cella*, Mr. Wood concludes that the thirty-six *columnæ cœlatæ* (sculptured columns) mentioned by Pliny were in these positions, especially since they are so shown in a medal of Hadrian's time, which shows a high band of sculpture above the bases of the columns under the pediment.

It is impossible to follow Mr. Wood through the unrecorded train of argument which has led to his restorations. For some of his conclusions he gives reasons, others are left without any thing to tell whether they are inference or conjecture. In many respects his restoration looks more Roman than Greek. Instead of two or three high steps around the platform, there are fourteen of only eight inches rise and nineteen inches tread. The Ionic order as restored has a half-Greek, half-Roman look. The height of the entablature is nearly one-third that of the columns. Fragments were found which gave authority for most of its parts, — the architrave, sculptured frieze, and the cymatium, at least, of the cornice, carved with a honeysuckle ornament and lions' heads, — how much more does not appear. The addition of dentils, made perhaps in deference to the indications of Hadrian's medal, and the height of the frieze in proportion to the architrave, give a Roman look to the entablature. The height of the columns has been fixed by the writer according to the proportions of Vitruvius, from the measured diameter of the drums at the base. Eight and a half diameters of six feet and half an inch, plus the base and capital, give a total height of fifty-five feet, eight and a half inches, which accords sufficiently with the height of sixty feet (Roman) assigned them by Pliny. The capitals are of an ordinary Greek form, the bases as near as may be like those of the better-known temple in the neighboring city of Priene, — a fluted torus at the top, and below it three narrow double beads with two *scotiæ* between them. One of these bases was found with the red color still preserved in the *scotiæ*. A curious bit of detail was "a fragment of moulded marble with two astragals, between which was doubled a narrow strip of thin lead, a strip of gold being inserted in the fold," — a hint of the splendor of decoration which, more than its architecture perhaps, led to the classing of the temple as one of the seven wonders of the world.

It is not easy to make out from the work how much of his discoveries the author assigns to the different temples he unearthed. The lower pavement would appear to have been the best preserved. In this, which was of nicely fitted blocks of marble of random shapes, was found a line of mortises between the *antæ* of the *pronaos*, as if to receive the uprights of a metal screen or grill. A socket of copper or bronze remained in one of the holes. In the polished white

marble pavement of the intermediate temple, four feet higher, were found marble tracks resting on solid foundations, and showing the grooves in which the wheels traversed that supported the heavy doors. The position of the mortises for the frame showed the width of the door, which was in two parts, to have been fourteen feet, eight and a half inches. The roof was evidently tiled with marble, many fragments being found, both of the flat tiles and of the curved tiles which covered the joints in the others. On the vexed question of the *hypæthrum*, Mr. Wood decides in favor of a simple central well. Around this he ranges, as usual, two orders of small columns; for examples of which, however, he points only to one fragment of a Corinthian shaft that he supposes to have belonged to the upper, and which, curiously enough, is elliptical in section. He assumes a lower order of Ionic columns, also with elliptical shafts.

We have confined our attention to what Mr. Wood has said of his search for the temple, since that was the *raison d'être* of all his labors. He gives his readers, however, restored plans of several other buildings, — the Odeum and great theatre, for instance, — both classical and Christian, and accounts or illustrations of many interesting fragments and inscriptions. The lithographs in the volume are fair, and many of the woodcuts excellent.

THEATRE FIRES.

THE following digest has been prepared at the request of the committee on revision of the New York Building Act, appointed by the New York Chapter of the A. I. A. It consists of a condensation of the chief facts contained in a treatise by Aug. Fölsch of Vienna, on the general subject of theatre fires, which he has investigated in a most masterly manner. This work was published by Waldheim, Vienna, 1870. I have taken the liberty of drawing an occasional inference, and suggesting an occasional change in our own laws, in the course of my paper.

DEC. 15, 1877. NELSON L. DERBY.

All experience has shown that in theatre fires, either the incipient flames are immediately extinguished, or the whole building is consumed. There is no half-way in the matter. At the Haymarket Theatre in 1867 in London, seventeen steam fire-engines and as many hand-engines were unable even to restrict the flames of the burning building to itself alone. If such a fire once gains headway, from the presence of the vast amount of combustible matter about the stage, no fire-proof construction can long arrest it. The strongest masonry is destroyed, marble burns to quicklime, cast iron is cracked and broken, wrought iron bends and gives way, and the building is as fully destroyed as if it were of wood. Statistics of fires show further, that in no theatre fire has any thing of value ever been rescued, so quickly do the flames spread.

Within the last century 130 theatres have been destroyed by fire. Some theatres, as Astley's Amphitheatre in London, have been burned three times. Of these 130 theatres, 17 were burned in London, 19 in Paris, and fewest of all in Italy, though in that country there are more theatres in proportion to the population than in any other part of the world. The mild climate of Italy requires little heating of theatres in winter, and spectacular pieces are uncommon. These reasons account for the fact stated. Between 1863 and 1869 — seven years — 43 theatres were burnt in different parts of the world.

Of all such fires it is found that 52 per cent take place between Dec. 1 and April 1; 48 per cent take place during the two hours after the close of a performance; 21 per cent during a performance. This is occasioned by sparks from fire-works, etc., used in spectacular pieces, which fall unnoticed, and cause a fire to break out after the close of the performance. This shows the necessity of keeping a sufficient number of watchmen, especially during the night in theatres, who shall be ready to extinguish the incipient flames. The necessity of a constant, even daily inspection of theatres, is proved by the burning of the Berlin Opera-House in 1843. The reservoir could not be used because the machinist was at home with the key in his pocket. Such doors should never be locked. At the Dresden fire, the wire curtain was found rusted and immovable, and all the reservoirs empty. In the fire at the Käruthnerthor Theatre in Vienna in 1761, many people were lost because the lower windows were covered by an iron grating. In the fire at Carlsrühe in 1847, some of the stairways from the upper galleries were locked. This was done to save doorkeepers' wages. Not only were they locked, but nailed and battened fast, while their existence was unknown to many. — This suggests the desirability of compelling managers to hang plans of their theatres on a large scale at various points in the building. — These doors were broken in at last; and this, with the accidental presence of several oil lamps which burned after the gas was shut off, saved many hundred lives.

In a large theatre it is necessary to keep on hand scenery and decorations for three or four pieces at least. This with the vast amount of cordage, bridges, traps, etc., found on every stage, points to the fact that the most important measure of all is to require all these inflammable substances to be soaked in or painted with some fire-proofing solution. Most desirable also is a law requiring that all draperies and decorations in churches and ball-rooms, as well as in theatres, should be thus protected; also the costumes of actors, especially the gauzy coverings of ballet-dancers. It appears, however, that many fire-proofing solutions which have been tried have been found after a time to lose their efficacy besides affecting the colors used in decoration. In Vienna, among other substances borate of magnesia has been tried, and found to fail. After many attempts there, to-day no substance is in use. Mr. Boucicault, I see, recommends tungstate of molybdena; but there is no doubt that the matter should be placed in the hands of chemists and thoroughly experimented upon.

In 41 per cent of all theatre fires, the flames have reached and destroyed the adjacent buildings; in 36 per cent of all cases these buildings have been attacked but saved. This points to the absolute necessity of isolating theatre buildings on all sides.

The loss of the Dresden Theatre was caused by the use of benzine in painting. This substance should never be allowed to pass the door of a theatre.

To show that the Brooklyn fire was by no means the most destructive of life of all theatre fires, I quote from our author that at Saragossa in 1788, 600 lives were lost; in Quebec in 1846, 500 perished.

The author now goes on to describe the Vienna Opera-House, which in comfort, interior taste, excellence of ventilation, solidity, and ingenuity of arrangement, is second to none in the world except the new Paris Opera-House, and is fully equal to this in many respects. On each side of the stage are two three-foot walls seven feet apart. These are stiffened by vaults running their whole length, and forming passages nine in number upon each side. These walls support the iron stage roof under which is suspended an iron and brick ceiling. A wire curtain weighing three tons and counterpoised is suspended above the proscenium opening. It is let down every night, and is seldom raised during rehearsals. Its meshes are only three-fourths of an inch wide. It takes a quarter of an hour to raise it, but by loosening the windlass and applying a brake it can be lowered rapidly though gently.

The building is warmed by steam and well ventilated, while it is possible to shut off the gas from the stage and auditorium without extinguishing that upon the stairs and corridors.

Two mains supply this theatre with water; one supplying exclusively the daily use, the other the fire service. Could we not, in view of the scarcity of Croton water, connect pipes with the rivers, and fill our reservoirs with salt water for the latter purpose, with the aid of steam pumps?

Reservoirs in the Vienna Theatre are placed above the rear stage. In the inspector's room gauges indicate the height of water in the same, whilst other registers show the temperature of thirty different points in the building. Through speaking-tubes, telegraphs, pipes, etc., he has control of the temperature and the water and gas supply of all parts of the theatre. The reservoirs above mentioned feed pipes running through the vaulted passages already described, also across the stage-bridges, under the stage, and to the store-rooms. These pipes are above ten inches, below five inches, in diameter. At frequent intervals are stop-cocks to which are attached flexible tubes with half-inch nozzles. In each passage by the side of the stage are small slits opening to the stage and closed by iron doors. Through these hundred and fifty openings half as many streams can be directed upon any portion of the scenery upon or above the stage.

Ten men are employed to watch this theatre, and of these eight are on duty during the performance and four by night. They are controlled by six dial registers.

The author concludes with a few suggestions, among them that theatres should be connected with the nearest engine-house by telegraph; once a week all fire-extinguishing apparatus should be overhauled (this is a regulation in the Vienna Theatre); only Swedish matches should be used (also in force at Vienna); and the watching of all theatres should be placed in the hands of the city fire brigade.

THE ILLUSTRATIONS.

DETAILS FROM THE HOUSE OF MARTIN L. BRIMMER, ESQ., BOSTON, MASS. MR. R. M. HUNT, ARCHITECT.

(28 East 21st Street, New York, N.Y.)

THIS drawing was prepared for the album of the Portfolio Club by Mr. G. M. Wells.

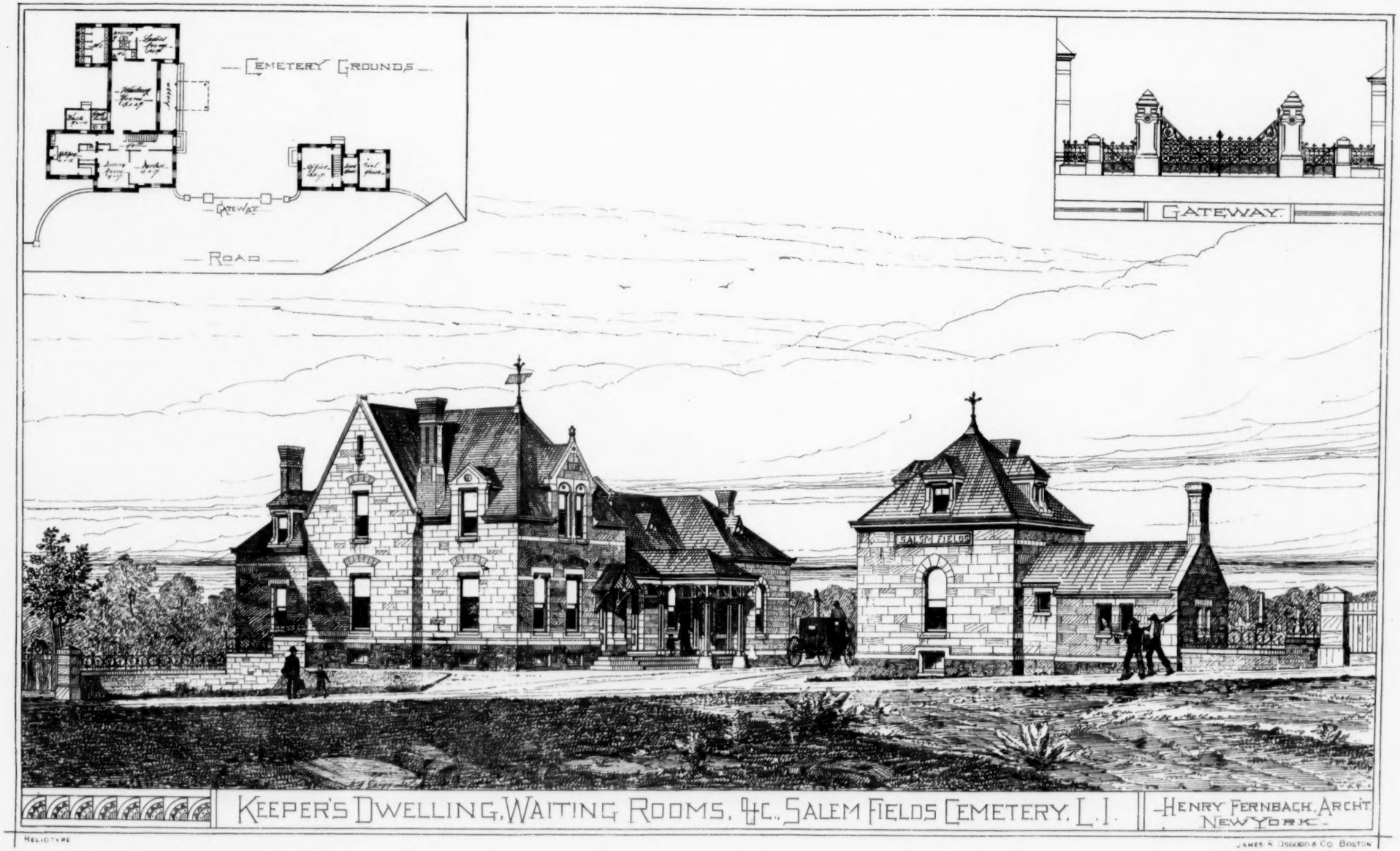
UNION CHAPEL, MORRIS PLAINS, N.J. MR. A. B. JENNINGS, ARCHITECT.

(71 Broadway, New York, N.Y.)

COUNTRY CHURCH ON ORANGE MOUNTAIN, N.Y. MESSRS. POTTER AND ROBERTSON, ARCHITECTS.

(52 William Street, New York, N.Y.)

American Architect and Building News. Jan. 27. 1877.



Keeper's Dwelling, Waiting Rooms, &c., Salem Fields Cemetery, L. I.

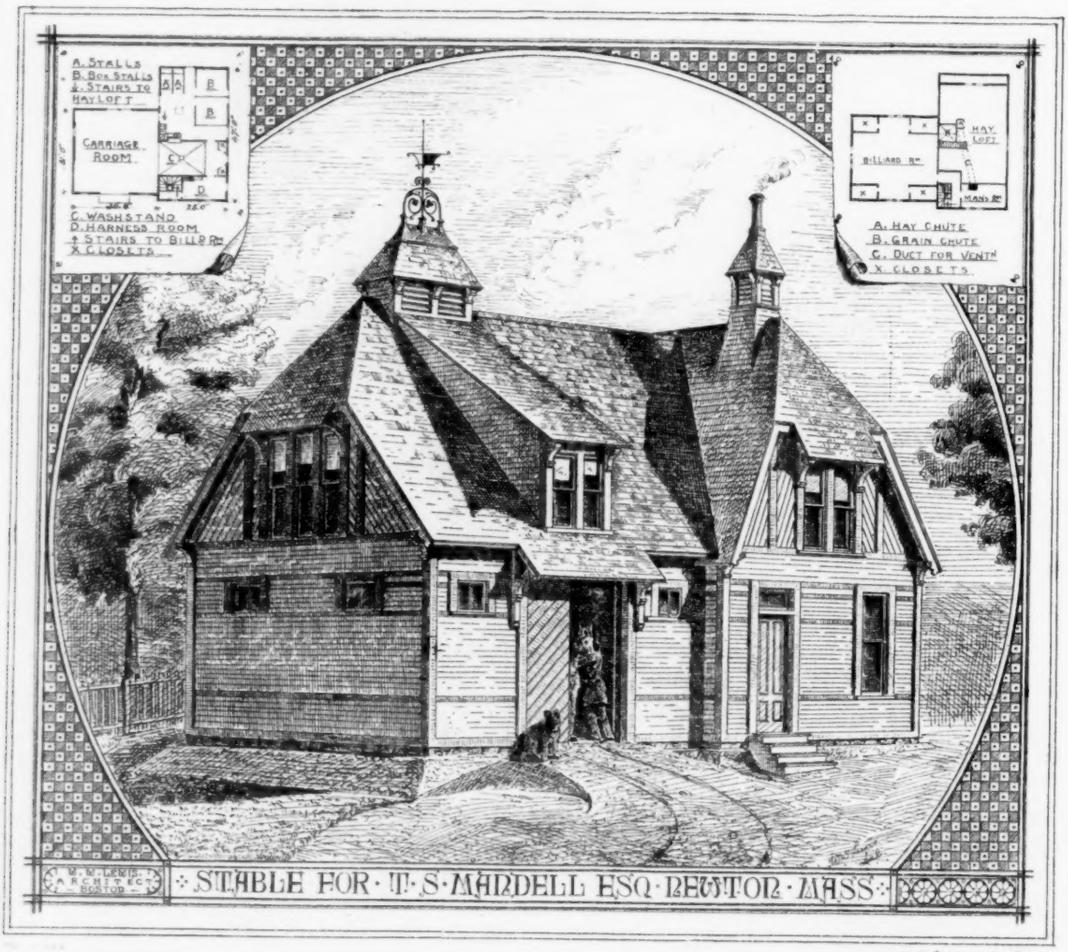
Henry Fernbach, Archt. New York.

Heliotype

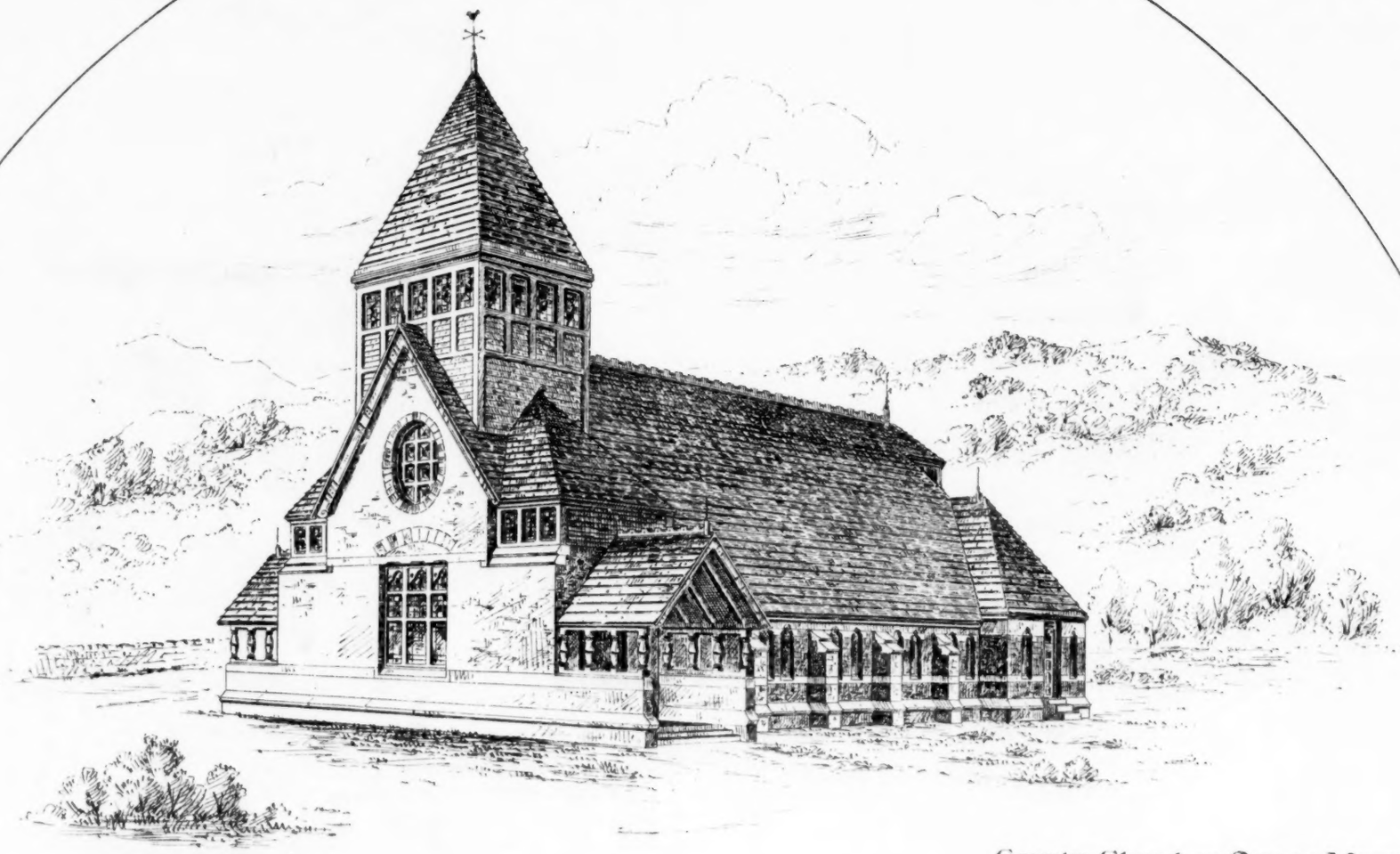
James R. Osgood & Co. Boston

DESIGN
FOR
UNION CHURCH
MORRIS PLAINS.
N.J.

A. B. JENNINGS
ARCHT.
71 BROADWAY
N.Y. CITY.



JAMES R. OSGOOD & CO. BOSTON



Country Church on Orange Mountain.
Potter & Robertson, Architects.
52 William St., N.Y.

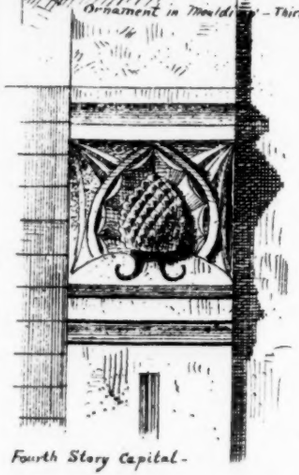
H. Edwards Fiemen, Del.

James R. Osgood & Co. Boston

DETAILS FROM MARTIN BRIMMER'S HOUSES
BEACON STREET-R.M. HUNT ARCHITECT

Ornament in Moulding - Second Story -

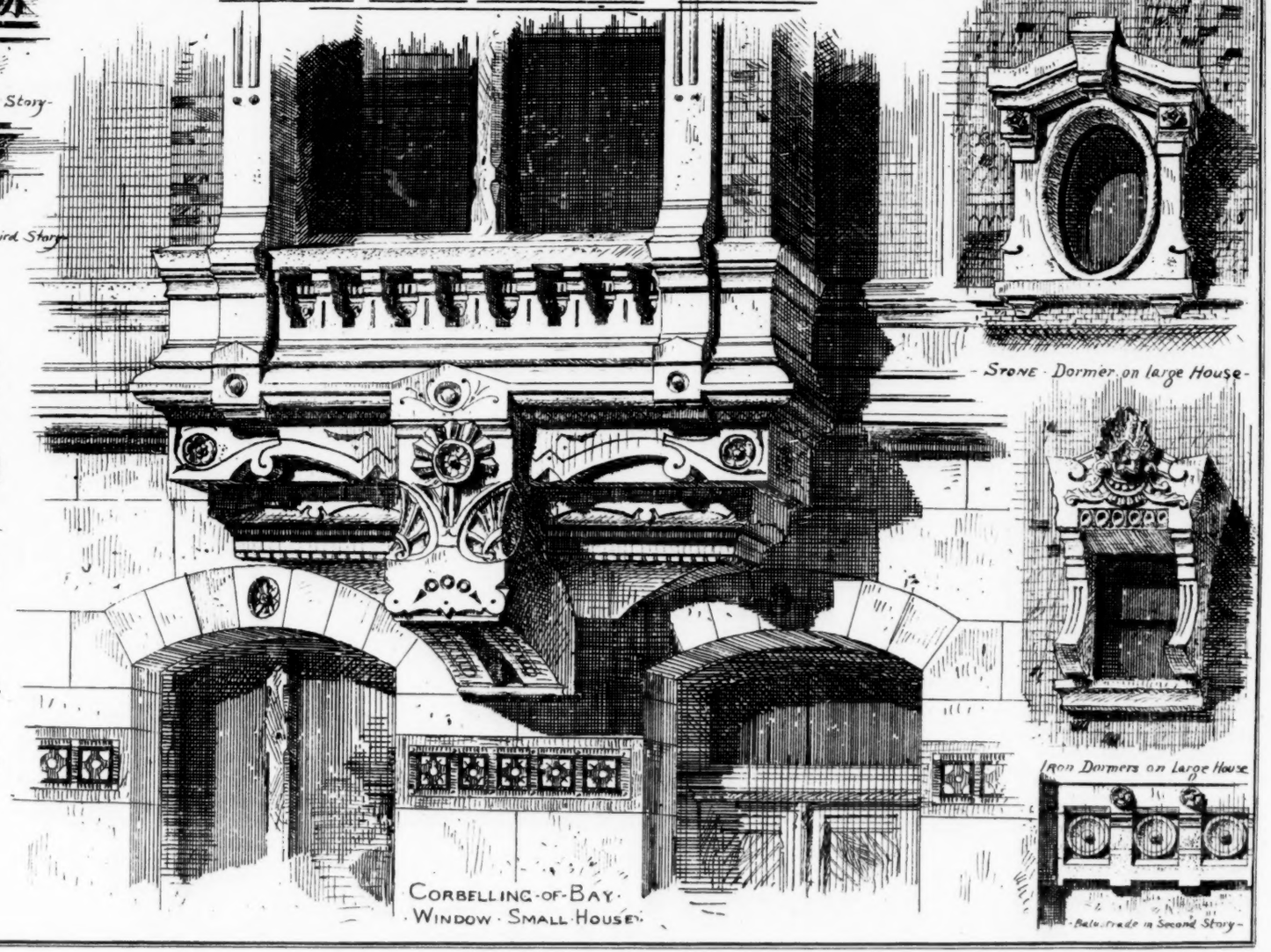
Ornament in Moulding - Third Story -



Fourth Story Capital -

Rosettes in third Story

J.M. WELLS - DEL -



CORBELLING OF BAY WINDOW SMALL HOUSE.

STONE Dormer on large House -

Iron Dormers on large House

Balustrade in Second Story -

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON

KEEPER'S DWELLING, WAITING-ROOMS, ETC., SALEM FIELDS CEMETERY, L.I. MR. HENRY FERNBACH, ARCHITECT.

(346-8 Broadway, New York, N.Y.)

STABLE FOR T. S. MANDELL, ESQ., NEWTON, MASS. MR. W. WHITNEY LEWIS, ARCHITECT.

(5 Pemberton Square, Boston, Mass.)

This stable gives accommodation for four horses, there being two stalls and two loose boxes. The washing floor is so placed as to be easily approached either from stalls or carriage-room, from which it can be separated by sliding doors, and the space so enclosed can be warmed by a stove in the harness-room. The billiard-room and man's room are reached by a separate entrance, without passing through the stable. The outside will be finished with clapboards, and the roof slated. The principal rooms are to be sheathed inside and finished with varnish.

CORRESPONDENCE.

ANNUAL REPORT OF THE SUPERINTENDENT OF BUILDINGS. — ACCIDENT AT THE GRAND CENTRAL DEPOT. — THE PROPOSED OPERA-HOUSE. — THE JEFFERSON MARKET COURT-HOUSE.

NEW YORK.

THE quarterly report of Supt. Adams of the Building Department here, just published, closing the calendar year 1876, is not altogether as gloomy a document as the depression in professional labor for the past season would seem to warrant. In his recapitulation Mr. Adams finds that "it is encouraging to note that the average building activity has not materially decreased." But this view is based upon the estimated cost of the works. The work has been in most part the duplication of tenement houses or the multiplication of brown-stone fronts. Architecturally the season has been bald and profitless. Little or nothing has been added to our city's display by the efforts of the architects, and from office to office the same reply of "only a little country work" is met in response to inquiries as to work in hand.

Taking the work of the closing quarters of the past three years, the Building Department report shows: —

	1874.	1875.	1876.
Plans submitted for new buildings,	198	160	137
No. of buildings embraced,	343	298	255
Estimated cost of same,	$3,775,170	$3,023,600	$2,804,430
New buildings commenced,	285	271	237
" " completed,	396	383	481
Plans submitted for alterations,	175	162	163
No. of buildings embraced therein,	190	163	179
Estimated cost of same,	$668,115	$329,190	$258,538
Alterations commenced,	168	140	172
" completed,	234	244	222
New buildings in progress Dec. 31,	....	578	651
Alterations " "	....	100	125

Of the 137 applications for the erection of new buildings, 116 were approved at first inspection, 18 were altered and subsequently approved, and 3 rejected outright; for the whole year 1876 this would make a total of 737 plans approved and 23 rejected. In alterations for the past quarter, 137 plans were approved, 22 altered and approved, and 4 rejected; for the year, 1,034 approved, and 56 finally rejected.

The number of sets of plans submitted during the several quarters of the past three years stand as follows: —

	1874.	1875.	1876.
1st Quarter,	224	202	196
2d "	284	296	207
3d "	172	161	169
4th "	198	160	137
	878	819	760

Summarizing the work of the past four years, the progress of building in the metropolis is very clearly shown in the grand estimates of cost as follows: —

YEAR.	NEW BUILDINGS. No.	NEW BUILDINGS. Cost.	ALTERATIONS. No.	ALTERATIONS. Cost.	TOTAL COST.
1873	1311	$22,276,645	1139	$3,496,995	$25,773,640
1874	1388	16,798,997	1429	3,616,112	20,415,109
1875	1406	18,072,850	1258	3,076,473	21,149,223
1876	1379	15,898,240	1177	3,635,478	19,533,718

As showing the general scope and character of the work covered by the figures of the past quarter, the report gives the distribution of the 255 buildings proposed as follows: First-class dwellings, 102; second-class, dwellings, 18; French flats, 24; hotel, 1; tenements, 40; first-class stores, 10; second-class store, 1; third-class stores, 2; office building, 1; manufactories and workshops, 23; school, 1; church, 1; public buildings (fire houses), 2; stables, 11; frame buildings (in suburban section of city), 13.

The reports of the several bureaus of the department are of interest. In the inspection of iron-work, charged with the testing of every iron lintel, girdle, and beam used, the year's work showed but one defective lintel. During the year, 1,688 fire-escapes have been added to dwelling-houses by order of the Department, 1,531 buildings have been made safe, and 71 entirely taken down; making a total for the past 11 years, during which time accurate data have been preserved, of 8,270 structures strengthened, and 552 entirely taken down.

In a recapitulation of the year's work, Superintendent Adams gives his views at length on the Brooklyn Theatre accident. The confusion in the duties of the several departments of the city government, which might be considered a chronic defect in our municipality, gives the superintendent a cover of escape for any responsibility he may seem to have shirked in allowing the erection and maintenance of the theatrical fire-boxes with which our metropolis is so well supplied. After detailing a list of protective devices which seem to him desirable, such as brick proscenium walls, iron screen and drop-curtain, iron staircases, abundance of exits, wet blankets, sprinklers, hose, etc., the report goes on to say that "having heretofore regarded them as under the supervision of the Department of Health or Fire, it came to be the custom of officers on the Department of Buildings to recommend these important protections, rather than order them with the authority of law. . . . It was not until the appalling disaster in Brooklyn had aroused public feeling to a realizing sense of the mighty perils to which thousands are exposed, that some absolutely authoritative interpretation of the law was demanded." The section of the building law governing the point at issue is quoted by Superintendent Adams, and reads as follows: —

"§ 29. In all buildings of a public character already erected or hereafter to be built in said city, such as hotels, churches, theatres, school-houses, restaurants, railroad depots, public halls, and other buildings used or intended to be used for purposes of public amusement or instruction, the halls, doors, stairways, seats, and aisles shall be so arranged as to facilitate egress in cases of fire or accident, and to afford the requisite and proper accommodation for the public protection in such cases; and all aisles and passage-ways in said buildings devoted to purposes of amusement or instruction shall be kept free from camp-stools, chairs, sofas, and other obstructions, during any performance, service, exhibition, lecture, concert, ball, or any public assemblage; and the superintendent of buildings may at any time serve a written or printed notice upon the owner, lessee, or manager of any of said buildings, directing any act or thing to be done in or about the arrangement of the said buildings and the several appliances therewith connected, such as halls, doors, stairs, windows, seats, aisles, and escapes, so as to afford the greatest possible security to the public in the uses to which they may be severally applied."

Of course the interpretation was as everybody but the studiously obtuse officials would make it, — that the proper and safe erection of a building lay with the building department; and now the inspectors are busy scurrying about, poking about the playhouses, preparing diagrams of them; and as a result of their work, several have undergone alterations, and one, the Olympic Variety Theatre, has been forced to close its doors for thorough overhauling.

On Friday morning, the 12th inst., a large section of the great glass roof of the Grand Central Depot fell. In the building there is a central section of the roof running along the ridge, raised above the other portions of the roof about eight feet, the sides forming a louvre for the escape of smoke and gas. The snow and ice had accumulated upon this top section. The slide was upon the east side, where the sun had loosened the hold of the ice on the iron, and two feet of ice and snow falling upon the glass broke it for a length of nearly two hundred feet. The panes of glass were about nine by two feet, and five-eighths of an inch thick, and over two hundred and fifty were brought down by the crash. It was formerly the custom to shovel off this top roof section after storms; but during this season this precaution was neglected. The building was designed by Supt. Buckhout of the New Haven Railroad Company as engineer, and J. B. Snook of this city as architect.

Hardly a season passes without the collapse of some building by the weight of snow upon the roof. A couple of years ago a church in the central part of the city was reduced to a mass of ruins between services one Sunday, by the superincumbent mass of ice on the roof. And the snow-slides from roofs are a constant source of annoyance and danger to pedestrians upon our street-walks.

Under the class of the "may-be's" should properly be placed the work of Mr. Arthur Gilman upon a grand opera-house for Mr. Strakosch, the impressario. The body of the house measures about 200 by 125 feet, with projections for stairways, etc. It is a close copy of the La Scala of Milan. Without, the work is in Italian Renaissance. Within there is a stage 50 x 67 feet, and an auditorium 105 feet from curtain to back of boxes, and a width of 90 feet, with a height from orchestra floor to ceiling of 65 feet. There are five box balconies with 80 boxes in each tier. There will be seats on the orchestra floor for 650, and in the upper gallery for 500 more, making the total capacity of the house about 3,000. The specifications call for a fire-proof construction throughout; concrete, tiling, and Tiel blocks are liberally used, with iron supplying the place of wood. It is a grand design on paper, and before long we shall know how many millions it will need to give this fancy a tangible shape.

More original in conception and now nearly completed is the Jefferson Market Court-House by Withers and Vaux, which some of our art critics declare to be the only piece of architecture with brain in it which our city can show, and which everybody agrees in declaring a gem in our street architecture: standing at the junction of several streets, it may be studied from ever so many points, and from each it will repay a long, careful survey. It is "Englishy" throughout, and shows that Messrs. Withers and Vaux have kept pace with the creators of Victorian Gothic across the sea. At some day it will make an interesting story to relate the contest of Cushing *vs.* Withers, and how a contractor, balked in his efforts to get disproportionate bills for extras, threw mud at

the architect. The introduction of the British surveyor or maker of bills of quantity was looked upon as a system of levy imposed by the architect; and generally the history of the charges and their refutation will teach all members of the profession that too much care cannot be taken in having all instructions to the workmen conveyed through the medium of the drawings and specifications, and holding each and every contractor to the uttermost item of work demanded by the exact letter of these documents.

The New York Chapter of the A. I. A. will hold its usual winter reception about Feb. 22, at the rooms of its president, R. M. Hunt, on Twenty-first Street near Broadway. A programme for a competition between the junior members of the Institute has been issued, and the reception promises to be an instructive and enjoyable one.

THE LOAN COLLECTION. — THE FURNITURE OF ST. GEORGE'S HOUSE. — THE PUBLIC BUILDINGS. — THE CATHOLIC FOUNTAIN. — THE BELLS OF ST. MARK'S. — THE THEATRES.

PHILADELPHIA.

THE loan collections, as a sort of dual exhibition, were opened last Monday evening, 15th inst., at the Academy of the Fine Arts. The north range of galleries has been devoted to the pictures, while the southern suite has been given over, for the time being, to the "Pennsylvania Museum and School of Industrial Art." The former has been arranged and catalogued with the usual care, while the latter is still only partially tabled and arranged. In fact, the general appearance of this portion suggests that the managers of this institution have a tendency to make it fulfil the first portion of its title at the expense of the second. If one might judge by the appearances of this collection, and the character of the objects exhibited, it would seem simply that the opportunity had been taken by a select portion of the community to show to the rest their *penates* and spoils of travel; indeed, judging from the comments one cannot help hearing, one might think that the name of the depositor is quite as much an object of interest as the article loaned.

Commencing in the corridor, which is enclosed by drapery on the arcade side, the wall hangings, one a fine large old Gobelin tapestry, and a remarkably good large rug from Masunpatam, with some smaller rugs and pieces of furniture-tapestry, pretty effectually cover up Rothermel's Christian Martyrs, and other academy horrors. Here is a grand old carved German cabinet of the sixteenth century, and adjoining it a dark carved bookcase of probably a century later; a table decorated with inlaid brass by Boule, and a pair of richly wrought brass firedogs, both relics of Marie Antoinette's establishment; and a curious folding Italian armchair, constructed of narrow curved strips, exactly like Savonarola's chair in his cell in the convent of San Marco, Florence. There are also some pieces of old Spanish stamped leather, and some excellent examples of wrought-iron work.

The next gallery offers a rich display of pottery in all its variety, — one case filled with an interesting selection of Greek, Roman, and Etruscan ware, another with an equally valuable collection of ancient Peruvian ware; the other cases are filled with bits of Japanese earthenware and porcelain, Italian maiolica, Spanish and Moorish pottery, *grès de Flandres*, Limoges faïence, old English ware, and a few choice bits of Sèvres; in the remaining cases are some fine pieces of Laque, Chinese, Japanese, and Persian, while in the opposite case are a few very handsome bronzes, several of which we recognize as old Centennial friends; the central large vase bearing, in inlay relief of precious metals, an illustration of the story of the Japanese hero who fastened the golden tags to the storks' legs, and then set them at liberty, by way of testing the question of their longevity. In this gallery and the next, "Death on the Pale Horse," and the "Deliverance of Leyden," are temporarily in "quod" behind yards of maroon dry goods; as it was realized at a very early stage of the arrangements that the pictures and their frames would utterly destroy the effect of the museum objects.

In the corridor which connects this with the next gallery are arranged the Elkington reproductions in electro of objects in art silver work in the South Kensington Museum and other European collections. On an easel, beside a case filled with some very choice bits of ivory-carving, stands the reproduction of the Milton shield, while in the opposite case are a great number of curious small objects of silver, mostly antique, such as peasants' jewelry, archery prizes, etc.

Mr. Sommerville's collection of engraved gems and cameos occupies the whole of the next gallery, and offers abundant material for a special notice.

Among the laces and enamels which are disposed in the next gallery are some wonderful examples. Here is a necklace of the gold and green enamel of Perturbhar; and at the end of this room is placed the great silver vase designed by Chantrey, and presented to Charles Kemble by the citizens of London, on his retirement from the stage.

In the remaining room, the textiles are disposed in cases, and hung against the dreadful copies of the old masters, which constitute what is known as the Gilpin Collection. Here are the rich oriental pieces lately jointly purchased from the Castellani Collection by the Pennsylvania Museum and the Boston Museum of Fine Arts. A case containing some rich embroideries, and textiles in silk and gold of the sixteenth and seventeenth centuries, stands against one wall; facing this is a smaller case hung with some exquisite bits of Chinese costume; and in the centre of the room is a case arranged with some of the richest Russian, Italian, and Oriental fabrics in the piece: cloth of gold, Genoese velvet, gold, Florentine, and Venetian brocades, and Indian scarfs heavy with gold, are here piled together in almost cloying richness.

Considering the novelty of the enterprise, and the very conservative character of the average Philadelphian, there is ground for encouragement in this exhibition, if the fact of the institution being, or rather announcing itself as a school, as well as a museum, is constantly remembered and provided for.

The artistic furniture which during the Centennial Exhibition lent such attractive completeness to the interior of St. George's House (the headquarters of the British Commission) was sold under the hammer on Tuesday (16th), and realized very fair though by no means enormous prices; that the pieces should have even sold well during the present hard times, is very evidently owing to the prestige which their late position has given them, for they could hardly have been considered otherwise than as second-hand, having been in constant use, and some of the pieces pretty hardly used, ever since the opening of the Exhibition. The pieces were mostly the work of Messrs. Collinson and Locke, and Cooper and Holt of London. It will always be a source of regret to those who have seen St. George's House in its completeness, that this furniture should not have been bought by the city at the time that it became the recipient of the house, instead of shifting over to it the very commonplace furniture from the discarded Municipal Building.

On the first of the year the Supreme Court formally occupied the chambers prepared for it in the new Public Buildings. This has been regarded as a movement tending to secure a continuance of the work which as yet is far from complete, and an effort to head off an attempt which has been pending in the courts to have the work stopped, and consequently the taxes reduced; but on the 15th inst. the Supreme Court affirmed the decision of the lower court, and refused to enjoin the commissioners from proceeding.

The statue of Commodore Mead was the only one of the five which came to the Centennial to grace the Catholic Total Abstinence Fountain, and there he stood alone all that holiday time like an unrelieved sentry, over the group of marble rockwork at the head of the "Avenue of the Republic;" a day or two since, two of his tardy companions arrived from Antwerp, — Archbishop John Carroll and Charles Carroll of Carrollton; in another month "Father Mathew," the fourth of the minor statues, is expected. The colossal figure of Moses as the central object will then alone be required to complete the work. Herman Kirn is the sculptor, and the material is a hard white marble from the Tyrol. As to the artistic merits of the work there is very little to say except that it is big, and occupies a very prominent position.

Bell-founders will no doubt take considerable interest in the decision which may be rendered in the prospective St. Mark's bells case, which has at last made its appearance at court, the complainants asking for an order of the court to restrain and regulate the ringing of the bells. The bells of other churches in the city ring at the same hours, and chime and peal quite as often, but no such complaint appears to have been made elsewhere; still it is very generally the desire of both those in favor of and opposed to the "noise" to have the matter settled finally.

The report of the building-inspectors submitted to councils on Friday last, on the condition of the theatres and other places of amusement, contains a clause which is by no means re-assuring to the play-goer; it states that "there is scarcely more than one theatre" — the Academy of Music is evidently the one referred to — "in the city, that is provided with sufficient means of egress from its galleries in case of a panic, and but few with sufficient means of egress from the rear, and not one where just such a fire as lately took place might not occur among the scenes."

Among the numerous suggestions which have been offered with a view of suppressing the frequency of fires, it is odd that no reference should have been made to an excellent though seemingly severe precaution which is in force in Paris. The law there provides that the representative occupant of a house or apartment in whose quarters a fire commences is subjected to a heavy fine, he being considered quite as individually responsible for the safety of the premises as he is for the rent or taxes.

OBITUARY.

ASHER CARTER.

CHICAGO, Jan. 17.

LAST Sunday morning, the 14th, died at his residence in this city, Asher Carter, architect. Death came without premonition or warning. Paralysis of the heart was the cause.

Mr. Carter was born in Morris County, N.J., Jan. 25, 1805, and consequently had nearly attained his seventy-second year. He was the son of a carpenter, and followed that trade, building and designing his own houses, at Morristown, N.J., until 1849, when he was appointed to superintend the erection of the Second Presbyterian Church in this city, at the south-east corner of

Wabash Avenue and Washington Street. This church was the first building of any architectural pretensions erected in Chicago. It was designed by James Renwick of New York, who had just completed Grace Church, and was then engaged on the Church of the Puritans on Union Square in that city. It was the first and only building erected in Chicago of the native prairie stone, which attracted so much attention, and had such a picturesque effect, from the fact that it was a white limestone impregnated with bitumen, which in warm weather would frequently run out of it. The church was destroyed — all except the main walls — by the great fire of 1871, and with a temporary roof was used as a wholesale clothing store for six months after the fire; but the property was soon after sold and the walls demolished. The land has not been built upon since.

It is remarkable that while this stone was never used for any other structure, the congregation of the Second Church rebuilt on another lot, at Twentieth Street and Michigan Avenue, with the same material, from plans made by Renwick, assisted by Mr. Addison, just twenty-three years after the first building had been commenced. Mr. Carter was asked to take the superintendence of the new structure, as he had done in 1849; but the already crowded work of the firm of Carter, Drake, & Wight, of which he was the senior partner, prevented this arrangement, and Mr. John Addison came on from the office of Mr. Renwick in New York, to take charge of the work.

During the erection of the old church, without having any definite purpose to become an architect, he employed his leisure time in making drawings for imaginary dwellings. These coming to the notice of members of the church and others, who in those primitive days of Chicago knew very little of the necessity of building ordinary houses from plans, he was employed to make similar drawings for them. Before the church was finished he found that he had grown into an architect almost without knowing it, being a natural offspring of the necessities of the time. Before this there was only one person professing to be an architect, — J. M. Van Osdel, who is still living, — and he had but a limited practice. With the very rapid growth of the city which dates from about this time, Mr. Carter's practice increased rapidly; and he was employed on all classes of buildings, many of them five-story stores, the wonders of the new city. In 1855 Mr. Carter took as a partner Augustus Bauer, now one of our most successful architects and vice-president of the Chicago Chapter. Carter and Bauer were for many years leading architects here, but at this time there were at least a dozen others. This partnership lasted until the beginning of the war. In 1864 Mr. Carter took as partner William H. Drake, who had been his pupil and assistant for many years. The firm of Carter & Drake was continued until after the fire in 1871, when P. B. Wight of New York joined the firm. Carter, Drake, and Wight practised nearly two years, and erected over half a hundred buildings in this time. On Jan. 1, 1873, Mr. Carter retired from the firm and the profession, and has since then lived in retirement, making frequent visits to the offices of his old partners, in whose success he has always taken a paternal interest.

In 1871 and 1872 he was a member of the Chicago Chapter, and Associate of the American Institute of Architects, from which he resigned on his retirement.

Mr. Carter was intimately associated with the architectural history of this city, having taken an active part in building and rebuilding it. He was not the architect of any very prominent buildings; but his practice was a private one, and his clients were the best and most respected citizens of the place. He never entered into a competition, and never solicited employment. He was conscientious in whatever he did to the last detail, and never asked or received a favor. The word "gentleness" describes the leading feature of his character. He never had an enemy, and no one ever spoke ill of him. He was respected and loved by all who knew him as an honest, upright, and faithful man, and a true type of Christianity. As an architect his whole life was an example, showing that one who is without greed, is scrupulous in his consideration for others, and independent and upright in his bearing toward all, cannot fail of success in every way; for he attained a substantial reward in a comfortable fortune of his own making, on which he was able to retire when he thought he had done his share of the work. But his greatest reward is the good name that he has left behind.

DRAINAGE IN LEVEL GROUND.

NEWPORT, R.I.

TO THE EDITOR OF THE AMERICAN ARCHITECT.

Dear Sir, — Mr. Henry R. Towne, in his communication on p. 14, instances the case of a house standing on level ground, such as prevails in the villages of Central New Jersey, and suggests the course to be pursued where the character of the surface makes it impossible to secure the requisite fall for the use of sub-irrigation drains. He supposes the case of "an ordinary house-lot, say fifty by an hundred and fifty." Let us suppose, by way of illustration, that the rear fifty feet of such a lot is to be used for the disposal of sewage by underground land-drain pipes. One of the conditions of the success of the system is that the slope shall not be too large. In arranging the sewerage of Lenox, Mass., where a large volume will be distributed, I have taken a fall of one in three hundred, or four inches to one hundred feet. For a private place where the wastes of a single household are to be accommodated, and where the flush-tank would not discharge more than from thirty to fifty gallons at a time, it would be better to have a fall of one in two hundred, or six inches to one hundred feet. More than this would be too much; and were the slope greater, I should propose to lay the lines on a course diagonal to the inclination of the land. The reason for this is, that if the inclination is greater, the flow runs too rapidly to the far ends of the lines, instead of leaking out more equally at each joint of its course.

To provide a fall of one in two hundred on the rear fifty feet of a level lot, would require a slope of only *three inches*, which could be made by the addition of an average depth of one and a half inches over the whole, requiring only about three hundred cubic feet of earth, — an amount less than the ordinary modifications in grade of any tolerably finished house-lot. Indeed, a part of the slope required could be given in the drains themselves, as there probably would be no disadvantage in making them a little more or a little less than twelve inches deep at their two ends.

I trust that this explains my statement that there is no practical difficulty in arranging for the application of this system, even on level ground. Of course provision must be made to deliver the soil-pipe, or the outlet of the flush-tank, at a point sufficiently high to reach these drains; but there is not the least difficulty in doing this. The question of cost, so far from being "ignored," is a leading argument in favor of the irrigation-drain system; for in no other way, even on level ground, can the problem be so cheaply solved.

Mr. Towne's suggestion for a leaching cesspool is simply inadmissible. I am confident that no sanitarian who has kept himself at all well informed of the progress of knowledge on this subject would permit the use of this device. The suggestions for the construction and ventilation of such a cesspool are practical and good in their way; but the objection to a cesspool is radical, and cannot be overcome. There are many conditions where, so far as the immediate occupant of the house is concerned, no harm may be done; and of course in the country, where the excavation is made at a distance from any probable future house site, there is less to be said against it. But in any congregation of houses in a town or village, the public authorities should strictly prohibit any such fouling of the earth. If the soil is so tight that there is no leaching, then, however loose the wall, there is no escape of the liquid. If through sand, gravel, porous strata, fissures in rock, or any other means of escape, the liquid soaks away, we may be quite sure that it will carry with it to greater and greater distances as time goes on, and as the soil becomes foul it will retain, the objectionable or dangerous ingredients. Deep down in the earth, away from the action of the atmosphere, we lose the effect of the cleansing oxidation of the air, and of the action of roots, which are the best agents in purifying all manner of sewage. In fact, the objection is a radical one.

We cannot safely retain on our premises a putrefying mass of organic filth; and our own safety and the safety of the community require that we shall not pour this filth into unknown subterranean recesses from which it may taint the water of wells and the ground-air under houses.

Mr. Towne suggests the cementing of cellar floors as a safeguard against the rising of foul air into the house. To accomplish this end such cementing must be absolutely tight, and the same tightness must be given to the surrounding wall. Both of these conditions are important to the best building, but they are often neglected for the sake of economy. So far as the drainage question is concerned, they would cost much more than would the adoption of the irrigation-drain system, even including the slight modification of grade that this might make necessary.

Mr. Towne asks, Why are we worse off with the exhalations from leaching into the deep soil (and under our houses) than with the irrigation system, where the whole of the decomposition takes place close to the surface of the ground?

Precisely because of the difference between a decomposition taking place in the absence of fresh air and roots, and the rapid and destructive process which these agencies insure. The most serious evils may result from the putrefaction of organic matters stored in large masses, or closely covered from the air. The same materials consumed by the concentrated oxygen of aërated earth, especially when an active vegetation stands ready to take up the results of the decomposition, produce no hurtful result.

Respectfully yours,
GEO. E. WARING, JUN.

FIRE-PROOF BUILDING.

SPRINGFIELD, MASS.

EDITOR AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — The Brooklyn disaster has naturally called forth a large number of suggestions and plans for improving the condition of buildings used for places of amusement; some wise and good, many foolish and bad. But the suggestions so far as we have seen, for new buildings, are for attaining only partial results. The impression seems to prevail that owners will not be willing to put

enough money into their buildings to make them completely safe. It is upon this point that we wish to say a few words.

Several years since, we had occasion to thoroughly investigate the subject of making a theatre completely fire-proof, reference being had especially to cost. We found, somewhat to our surprise then, that the cost would not greatly exceed that of the ordinary construction then in use. This was however before the public had evinced the interest in such matters which the events of later years have produced, and before we had the experience which we have since acquired. Many of the methods then proposed were new, and though since used in other buildings with great success, were then experimental; and the owner finally decided for some of the partial results of which we have spoken.

Now many years of experience and the success of these very methods lead us to express the belief that a theatre building, which should be the safest of all constructions, *can* be made thoroughly fire-proof at a cost which will compare favorably with that of ordinary methods of construction. It is to be hoped that now the agitation will be kept up, till no committee will even think of putting up a schoolhouse, or any person a theatre or public hall, which will not be in every particular fire-proof. And if architects will show to their clients that the cost of constructing such buildings need not be so great as to deter them, we will bear them out whenever they refer to us. Very truly,

GEO. DWIGHT, JUN., & CO.

BRICK ROOFS.

LAWRENCE, KAN.

EDITOR AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — While in New York City last summer, I noticed that the deck portions of the roof of the Equitable Life Building were roofed with hard brick laid in cement. This is a new idea to me, but I find upon inquiry that it has been used in some parts of Ohio.

Assertions have been made here that the expansion of the bricks under the heat of the sun would be sufficient to break the cement, and thereby cause leakage.

I have experimented with some hard bricks, and at 120° Fahrenheit I find the expansion to be only $\frac{1}{64}$ of an inch in the length. Can any Eastern architects enlighten me upon the subject of brick roofs? Yours, etc., L. M. WOOD.

THE CATHEDRAL OF STS. PETER AND PAUL.

PHILADELPHIA, Jan. 17, 1877.

EDITOR AMERICAN ARCHITECT AND BUILDING NEWS.

Sir, — In the *Building News* for Jan. 6, your Philadelphia correspondent mentions the Roman Catholic Cathedral of Sts. Peter and Paul as having been designed by Mr. Le Brun.

I beg leave to state that the cathedral was designed by the late Mr. John Notman of this city, and the exterior, except the dome, completed under his superintendence; when, in consequence of a disagreement between him and his clients, he gave up the work. The interior of the building and the dome were completed under Mr. Le Brun's direction.

The store on Arch Street referred to by your correspondent (which I take to be No. 418) was also the work of Mr. Notman.

Respectfully, etc., M.

A JOURNEY OF AN ARCHITECT IN THE NORTH-WEST OF EUROPE. — II.

DUTCH COMPETITIONS.

"WHEN we had gone over Haarlem, we were invited to attend a very curious meeting, of which the reader will be glad to hear some particulars, for it was called for the purpose of deciding on a competition for the plan of a building; and there never was in France among architects a more *bona fide* competition.

"A neighboring town, wishing to erect an elegant fountain in a public square, asked for plans and tenders for the work. Several architects and sculptors answered to this appeal. The decision was made. Of course every one was very discontented except the successful candidate; but this was not all. Each of the others declared that the judges had not adhered to the conditions of the plan laid down, and that he had fallen a victim to the strictness with which he had observed the required conditions, etc., — such protestations and complaints as are always sure to be made in case of a competition, whether it takes place in Holland or in France, and which we have always known to recur on every occasion. Thus far there was nothing new; but at this point the novelty commences; for after the decision, the judges are expected to give a public account to the competitors of the motives which decided them, and which caused them to incline to the right hand or the left. This account was to be given at the meeting to which we were invited.

"It was a very interesting occasion. The competitors were numerous. Each one claimed the right of putting two questions to the foreman of the jury, who replied after having consulted with his colleagues. There could therefore be no decision with closed doors, no influence of party or position. A therefore could not give his vote to the son of B, on condition that B should on the next day vote for A.

"The questions proposed were of course clear, precise, expressed in very good terms, and with the calmness and good temper which a Dutchman always displays, and which requires a categorical answer free from circumlocution and subterfuge. It was not sufficient to say to an unsuccesssul candidate, "I consider your plan a bad one;" for he demands immediately why and in what respect this judgment has been formed, and he has the right to expect an answer.

"Thus, having been closely pressed by one of the candidates, the president made the following reply: —

"'A programme cannot always be literally carried out: we must interpret the spirit of it. This is a matter of tact and judgment. Suppose, for example, it was proposed to study the arrangement of a floor of a building consisting of four rooms. Among those who send in plans, the first places his apartments behind each other. He fulfils the conditions, but the arrangement is bad. Another divides a rectangle into four parts. He also fulfils the programme; and yet his solution is no better than the former. A third, however, makes his four rooms independent of each other by means of a hall. His project is a good one. Would you accuse him of having violated the conditions because he has introduced another element, the hall, which was not specified? For my part, I should not hesitate to give him the preference; and it is a consideration of this nature which has caused the rejection of your plan. You have complied faithfully, but in a servile manner, with the conditions imposed. Another has understood and interpreted them better; he has been more intelligent and skilful, and has justified the preference which has been given to him.'

"There was no replying to this argument, as it was stated in so simple and moderate a manner; and, indeed, this mode of discussion, by immediately adducing an apposite example in order to render the demonstration more striking, is quite in keeping with the upright and practical disposition of the Dutch people.

"Why could not we follow this example? Is it not in accordance with our disposition? I see no reason, at least, that we should not try it; and if it should become a regular custom among ourselves for architects to be called upon to compete with each other, by supplying designs for public works, a plan much to be desired, it would be necessary, in order to encourage this innovation, to surround the decision with every possible condition of impartiality; and unquestionably the best means of effecting this is to give each candidate an opportunity, on the day following the decision, to ask the judge the reasons for his preference, without its being possible for him to refuse to reply, or to shelter himself behind the opinions of his colleagues as was the case at ——, where an unfortunate competitor showed, one day, letters of condolence received from his four judges, each throwing upon the others the responsibility of the decision at which they had arrived."

NOTES AND CLIPPINGS.

THE BROOKLYN MUNICIPAL BUILDINGS. — The inquiry in a late number as to who are the architects of the Brooklyn Municipal Buildings has been answered by the statement that Messrs. Ditmar and Mumford of Brooklyn are the authors of the design accepted in competition.

AGRICULTURAL HALL. — Agricultural Hall, at the Centennial, is to be taken apart and shipped to Spring Lake, near Sea Girt. Out of its wood and glass, a hotel, a railroad depot, and eight cottages are to be built.

FALL OF A BRICK CORNICE. — A portion of the cornice of an old and dilapidated tenement-house in New York fell on the 19th inst., and severely injured six children who were at play in the yard beneath it. The attention of the landlord had been frequently directed to the insecure condition of the cornice.

FALL OF A BUILDING. — A frame building 40 by 80, and 40 feet high, at Flint, Mich., partially finished, fell on the afternoon of the 18th inst., burying in the ruins four men who were on the roof, two of whom were seriously injured. The others were not hurt.

A NEW STEAMSHIP DEPOT. — The new depot which the General Transatlantic Company has been constructing at New York on the North River, at pier No. 42, is nearly finished. It covers a space of 541 feet in length by 75 feet in width, and is built in the shape of a tunnel. The vertical height at the centre is 40 feet. The storage-room is 32,480 square feet, and the capacity for freight is 18,270 tons, being 75 pounds to the square foot. The building is supposed to be entirely fireproof, galvanized iron being used for the most part. A water-conduit four inches in diameter runs its entire length from the quay to the western extremity, to which hose can be fixed. On the east side, fronting on West Street, stands a smaller structure, forty-five feet in depth, in which are situated the offices, including a telegraph-station. The exterior of this building is entirely covered with galvanized iron plating. A steam machine of seventy horse power is used to load and discharge the steamers. The building is entirely lit by gas, and the light is equally distributed through all its length by means of powerful reflectors suspended at a height of thirty feet. All the arrangements are well fitted for shipping purposes.